



NEURAL INTERFACES WORKSHOP

AUGUST 21-23, 2006

Bethesda North Marriott Hotel & Conference Center • Bethesda, MD

AGENDA

MONDAY, AUGUST 21, 2006

- 7:30 – 8:00 a.m. **Registration/Continental Breakfast**
Poster/Display area open
- 8:00 – 8:05 a.m. **Introduction and Goals**
Dr. Joseph Pancrazio, National Institute of Neurological Disorders and Stroke (NINDS)
- 8:05 – 8:10 a.m. **Welcome**
Dr. Story Landis, Director, NINDS
- 8:10 – 8:15 a.m. **Plenary Session 1: Neural Function in Parkinson's Disease:
Implications for Deep Brain Stimulation**
Moderator: Dr. Eugene Oliver, NINDS
- 8:15 – 8:40 a.m. **Mechanism of Deep Brain Stimulation**
Dr. Joel Perlmutter, Washington University
- 8:40 – 9:05 a.m. **Cellular Mechanisms Underlying the Therapeutic Benefit of
High-Frequency Stimulation of the Subthalamic Nucleus**
Dr. Mark Bevan, Northwestern University
- 9:05 – 9:30 a.m. **Computational Analysis of Deep Brain Stimulation for Parkinson's Disease**
*Dr. Cameron McIntyre, Cleveland Clinic Foundation
- 9:30 – 9:50 a.m. Discussion
- 9:50 – 10:10 a.m. *Break*
- 10:10 – 10:40 a.m. **The Patient Perspective on Deep Brain Stimulation**
Moderator: Dr. Jeffrey Wertheimer, Brooks Rehabilitation Center
Panelists: Dr. David Heydrick, Parkinson's Action Network
Ms. Margaret Tuchman, The Parkinson Alliance



NATIONAL INSTITUTE OF
NEUROLOGICAL
DISORDERS AND STROKE

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National Institute on Aging



NIMH
National Institute
of Mental Health

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MONDAY, AUGUST 21, 2006 (CONTINUED)

- 10:45 – 11:35 a.m. **Panel Discussion: Optimizing Deep Brain Stimulation Implantation and Targeting**
Moderator: Dr. Warren Grill, Duke University
Panelists: Dr. Jean Saint-Cyr, Toronto Western Research Institute
* Dr. Peter Konrad, Vanderbilt University
Dr. Jens Volkmann, Christian-Albrechts University
- 11:35 a.m. – 12:00 noon **Platform Presentations (Four Presentations)**
Facilitator: Dr. Joseph Pancrazio, NINDS
* Todd Whitehurst, Advanced Bionics Corporation
Stephen Wong, University of Pennsylvania
Nathalia Peixoto, George Mason University
Richard Murrow, University of North Carolina
- 12:00 – 1:00 p.m. *Lunch*
- 1:00 – 2:00 p.m. Poster Session
- 2:00 – 2:05 p.m. **Plenary Session 2: New Applications for Deep Brain Stimulation**
Moderator: Dr. Joseph Pancrazio, NINDS
- 2:05 – 2:30 p.m. **Modulating Putative Depression Circuits using DBS**
*Dr. Helen Mayberg, Emory University
- 2:30 – 2:55 p.m. **Central Thalamic Stimulation for Treatment of Traumatic Brain Injuries**
*Dr. Nicholas Schiff, Cornell University
- 2:55 – 3:20 p.m. **Deep Brain Stimulation for Tourette's Disorder**
Dr. Roger Kurlan, University of Rochester
- 3:20 – 3:40 p.m. Discussion
- 3:40 – 4:00 p.m. *Break*
- 4:00 – 4:25 p.m. **Special Report: Open Architectures for Neural Interfaces**
Moderator: Dr. Roger Miller, National Institute on Deafness and Other Communication Disorders (NIDCD)
- Open Architecture Research Interface for Cochlear Implants**
Dr. Philip Loizou, University of Texas at Dallas
- 4:25 – 4:30 p.m. **Plenary Session 3: Tissue/Device Interface**
Moderator: Dr. Joseph Pancrazio, NINDS
- 4:30 – 4:55 p.m. **Histological Characterization of Brain Tissue after Deep Brain Stimulation**
Dr. William Shain, Wadsworth Center

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MONDAY, AUGUST 21, 2006 (CONTINUED)

- 4:55 – 5:20 p.m. **Central Nervous System Response to Implanted Materials**
Dr. Patrick Tresco, University of Utah
- 5:20 – 5:35 p.m. Discussion
- 5:45 – 6:30 p.m. Posters Available for Viewing

TUESDAY, AUGUST 22, 2006

- 7:30 – 8:00 a.m. **Registration/Continental Breakfast**
Poster/Display area open
- 8:00 – 8:05 a.m. **Introduction and Goals**
Dr. Joseph Pancrazio, NINDS
- 8:05 – 8:15 a.m. **User Perspective Talk**
Jennifer French, Neurotech Network
- 8:15 – 8:20 a.m. **Plenary Session 4: Progress in Functional Neuromuscular Stimulation**
Moderator: Dr. Nancy Shinowara, National Institute of Child Health
and Human Development (NICHD)
- 8:20 – 8:55 a.m. **Cortical Control of an Upper Extremity Functional
Neuromuscular Stimulation**
Dr. Robert Kirsch, Case Western Reserve University
- 8:55 – 9:20 a.m. **BIONic Neuromuscular Interfaces**
*Dr. Gerald Loeb, University of Southern California
- 9:20 – 9:35 a.m. Discussion
- 9:35 – 10:00 a.m. **Special Report: BrainGate Trial Update: Spinal Cord Injury,
Stroke and ALS**
*Dr. John Donoghue, Cyberkinetics Inc. and Brown University
*Dr. Leigh Hochberg, Brown University and Harvard Medical University
- 10:00 – 10:15 a.m. *Break*
- 10:15 – 11:30 a.m. **Panel Discussion: Functional Neuromuscular Stimulation
Approaches to Standing and Walking**
Moderator: Dr. Naomi Kleitman, NINDS
Panelists: Dr. Patrick Jacobs, Florida International University
Dr. Ronald Triolo, Case Western Reserve University
*Dr. Richard Normann, University of Utah
Dr. Vivian Mushahwar, University of Alberta

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TUESDAY, AUGUST 22, 2006 (CONTINUED)

- 11:35 a.m. – 12:00 noon **Platform Presentations (Four Presentations)**
Facilitator: Dr. Joseph Pancrazio, NINDS
Paul Yoo, Duke University
John Pezaris, Harvard Medical School
Ken Gall, Georgia Institute of Technology
Lee Miller, Northwestern University School of Medicine
- 12:00 – 1:00 p.m. *Lunch (on your own)*
- 1:00 – 2:00 p.m. Poster Session
- 2:00 – 2:05 p.m. **Plenary Session 5: Progress in Electrode Technologies**
Moderator: Dr. Grace Peng, National Institute of Biomedical
Imaging and Bioengineering (NIBIB)
- 2:05 – 2:30 p.m. **Smart MEMS Recording Systems**
Dr. Richard Andersen, California Institute of Technology
- 2:30 – 2:55 p.m. **Selective Interface with the Nervous System**
Dr. Dominique Durand, Case Western Reserve University
- 2:55 – 3:20 p.m. **National Center for Neural Communication Technology:
Developing Advanced Microscale Devices for Chronic Neural Interfaces**
Dr. Daryl Kipke, University of Michigan
- 3:20 – 3:35 p.m. Discussion
- 3:35 – 3:40 p.m. **Plenary Session 6: Tactile and Proprioceptive Feedback**
Moderator: Dr. Joseph Pancrazio, NINDS
- 3:40 – 4:05 p.m. **Somatosensory Neuroprosthesis**
Dr. John Chapin, SUNY Brooklyn
- 4:05 – 4:30 p.m. **Microelectrode Arrays in Dorsal Root Ganglia to Sense Position
and Provide Feedback for FES**
*Dr. Richard Stein, University of Alberta
- 4:30 – 4:45 p.m. Discussion
- 4:45 – 5:00 p.m. *Break*
- 5:00 – 5:45 p.m. **Breakout Session I – Research Support of Neural Engineering**
Panelists: Dr. Danielle Kerkovich, U.S. Department of Veterans Affairs
Dr. Kenneth Curley, Technology Research Center
Mr. Mark Donahey, Science and Technology Associates, Inc.
Dr. Semahat Demir, National Science Foundation
- Breakout Session II – Training and Fellowship Opportunities**
Dr. Stephen Korn, NINDS
- 5:45 – 6:30 p.m. Posters Available for Viewing

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WEDNESDAY, AUGUST 23, 2006

- 7:30 – 8:00 a.m. **Registration**
Poster/Display area open
- 8:00 – 8:05 a.m. **Plenary Session 7: Advances in Cochlear Prostheses**
Moderator: Dr. Roger Miller, NIDCD
- 8:05 – 8:30 a.m. **Effects of Remaining Hair Cells on Cochlear Implant Function**
Dr. Paul Abbas, University of Iowa
- 8:30 – 8:55 a.m. **Hearing Restoration by Direct Auditory Nerve Stimulation**
Dr. John Middlebrooks, University of Michigan
- 8:55 – 9:20 a.m. **Neurophysiological Indications of Channel Interaction During Cochlear Prosthesis Stimulation**
Dr. Ben Bonham, University of California at San Francisco
- 9:20 – 9:45 a.m. **A Central Auditory Prostheses Based on Silicon Substrate Microprobes**
Dr. Douglas McCreery, Huntington Medical Research Institutes
- 9:45 – 10:00 a.m. Discussion
- 10:00 – 10:15 a.m. *Break*
- 10:15 – 10:20 a.m. **Special Report: Molecular Neural Interfaces**
Dr. Joseph Pancrazio, NINDS
- 10:20 – 10:50 a.m. **Optics-Based High-Speed Neural Interfaces**
Dr. Karl Deisseroth, Stanford University
- 10:50 – 10:55 a.m. **Plenary Session 8: Therapeutic and Regenerative Effects of Stimulation**
Moderator: Dr. Daofen Chen, NINDS
- 10:55 – 11:20 a.m. **Auditory Nerve Rescue in the Deafened Cochlea: New Strategies for Cochlear Implantation**
Dr. Robert Shepherd, University of Melbourne
- 11:20 – 11:45 a.m. **Modulating Brain Activity to Facilitate Stroke Recovery**
Dr. Gottfried Schlaug, Harvard University
- 11:45 – 12:10 p.m. **Long-Term Re-organization of Motor Cortical Output Induced by an Electronic Neural Implant**
Dr. Andrew Jackson, University of Washington
- 12:10 – 12:25 p.m. Discussion
- 12:25 p.m. Meeting Adjourns and Poster Removal